

REMARKS/ARGUMENTS

Reconsideration of the current amendment, as amended, is respectfully requested.

Paragraph on various pages of the specification were amended to correct typographical errors.

With respect to the claims, all previously pending claims 1-60 were rejected. Claims 1, 5-10, 17, 21-27, 29, 43, 45, 49-55 and 57-60 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,292,289 which issued September 18, 2001 to Y. Sugaya *et al.* Claims 2-4, 16, 18-20, 28, 30-42, 44, 46-48 and 56 were rejected under 35 U.S.C. §103(a) as being obvious of the cited Sugaya patent in view of U.S. Patent No. 6,683,712, which issued January 27, 2004 to T. Tanaka *et al.*

The applicants have accordingly amended claims 1, 4, 8-10, 12, 14-17, 20-21, 24-30, 32-33, 35-38, 42-43, 48-49, 52-58 and 60; canceled claims 5-7, 13, 22-23, 31, 41, 50-51 and 59; and added new claims 61-68. The applicants make their arguments with respect to independent claims 1, 15, 33 and 43, which, as amended, incorporate some of the limitations of dependent claims. The arguments attempt to address the rejection of these dependent claims as much as possible.

Specifically, independent claim 1 was amended to incorporate the limitations of claim 6 somewhat. Claim 1 now reads:

A method of providing automatic gain and tilt control in a WDM (wavelength division multiplexing) optical communication system, the method comprising:

receiving over an optical fiber at least one sub-band of WDM signals and first and second reference signals, the first reference signal at a first boundary of the sub-band and the second reference signal at a second boundary of the sub-band;

detecting the first and second reference signals;

analyzing the reference signals to determine power variation of the reference signals;
outputting a control signal to compensate for losses and gain tilt accumulation in the sub-band associated with the optical fiber based upon the analyzing step; and
controlling an optical gain unit in response to the control signal.

With respect to the rejection of claim 6, the Examiner stated, "Regarding claims 6, 13, 14, 22-50, 59 60, Sugaya further discloses one supervisory optical source (same as reference signal) is set in the C band and the other is set in the L band (col. 9, lines 44-49, col. 17, lines 59-65." It is readily evident that in the Examiner's evaluation of the Sugaya patent, the reference does not teach the applicants' claimed invention. First, the first and second reference signals are at the boundary of a sub-band of WDM signals. The Examiner identifies one supervisory optical sources in one WDM band, not two. Note that claims 14 and 62 further draw out the distinction between the applicants' claimed invention and the teachings of the Sugaya patent. Secondly, the first and second reference signals are at the first and second boundaries of the WDM sub-band. There is no teaching in the Sugaya patent as to the particular location of the supervisory optical source in the WDM band. Thirdly, there is no teaching in the Sugaya patent of "...a control signal to compensate for losses and gain tilt accumulation in the sub-band associated with the optical fiber..." as recited in claim 1.

Hence it should be evident that claim 1 is patentably distinguishable from the Sugaya patent and should be allowable. Claims 2-4, 8-12, 14, 61 and 62 should be allowable for at least being dependent upon an allowable base claim. Furthermore, as pointed out with respect to claims 14 and 62, at least some of the claims are allowable in their own right.

Independent claim 15 was also amended to include some of the limitations of claim 22. Claim 15 now reads:

A WDM (wavelength division multiplexing) optical communication system for providing automatic gain and tilt control, comprising:

an optical fiber that carries at least one sub-band of WDM optical signals, a first reference signal at a first boundary of the sub-band, and a second reference signal at a second boundary of the sub-band;

an optical gain unit coupled to the optical fiber and configured to output lights to compensate for losses and gain tilt accumulation in the sub-band; and

a controller configured to control the optical gain unit, the controller detecting and analyzing the reference signals to determine power variation of the reference signals, wherein the controller outputs a control signal to the optical gain unit based upon the analyzed reference signals.

The Examiner used the same reasoning as cited above in rejecting dependent claim 22 and by the same arguments made above, claim 15 should be allowable. Again, certain claims make very clear the distinction between the teachings of the Sugaya patent and the applicants' invention. For example, see dependent claims 32 and 64. Hence independent claim 15 is not anticipated by the Sugaya patent and should be allowed. Dependent claims 16-21, 24-30, 32, 63 and 64 should at least be allowable for being dependent upon an allowable base claims. Furthermore, at least some of the claims, such as 32 and 64, are allowable in their own right.

Likewise, remaining independent claims 33 and 43 have limitations similar to those in claims 1 and 15. For the convenience of the Examiner, these claims are reproduced below:

33: An optical device for providing automatic gain and tilt control in a WDM (wavelength division multiplexing) optical communication system, comprising:

an input coupled to an optical fiber carrying at least one sub-band of WDM optical signals and reference signals at the boundaries of the sub-band, the input receiving the reference signals;

a plurality of photodiodes configured to convert the reference signals to corresponding electrical signals; and

a controller coupled to the photodiodes and configured to output a control signal to at least one Raman pump unit and a variable optical attenuator to compensate for gain tilt and gain variation based upon the reference signals.

43: A WDM (wavelength division multiplexing) optical communication system for providing automatic gain and tilt control, comprising:

an optical fiber that carries at least one sub-band of WDM optical signals and reference signals at the boundaries of the sub-band;

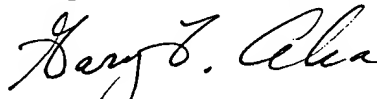
a light emitting means coupled to the optical fiber for outputting lights to compensate for losses and gain tilt accumulation;

a controlling means for controlling the light emitting means, the controlling means detecting and analyzing the reference signals to determine power variation of the reference signals, the controlling means outputting a control signal to the optical gain unit based upon the analyzed reference.

It should be evident that by the arguments above, these amended claims are also distinguishable over the cited Sugaya patent and the Tanaka patent, either singly or in combination. Hence these claims 33 and 43 and their dependents, i.e., claims 34-40, 42, 44-49, 52-58, 60, 65-68 should be also allowable.

Therefore, given the amendments above and the remarks directed thereto, the applicants respectfully request that the rejections be withdrawn, that claims 1-4, 8-12, 14-21, 24-30, 32-40, 42-49, 52-58 and 60-68 be allowed, and the case be passed to issue. If a telephone conference would in any way expedite the prosecution of the application, the Examiner is requested to telephone the undersigned at (408) 446-7687.

Respectfully submitted,



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